

ELABORATIONS

News and Issues for Washington's Clinical Laboratories

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Laboratory Safety – It's Everyone's Responsibility

by Liz Dykstra, DOH/PHL

It's a busy day at the lab – as usual. Today is special though - your child is a starter for the first time in her soccer game that starts in 30 minutes. You're hurrying to finish up your work and head out so you can make it to the game by starting time. You rush to wrap up the testing on some *Salmonella* cultures and do a cursory wipe-down of the bench where you were working. However, you weren't thorough enough and microscopic droplets of culture broth containing *Salmonella* are still present on the bench. Neglecting to remove your gloves, which happen to have traces of *Salmonella* on them, you hastily type in the test results on the lab computer before taking off your lab gear, washing up and dashing out the door. A few minutes later, a colleague comes by and does some data entry on the same computer, using his bare hands. After finishing at the computer, he swings by the lunchroom where some cookies have been left on the table. Grabbing a cookie with a *Salmonella*-contaminated hand, he happily enjoys a sugar fix peppered with *Salmonella*. The next day your colleague calls in sick, complaining of diarrhea, nausea and cramps and leaving you to shoulder a greater burden of work.

Sound far fetched? It's not.

Clinical laboratorians are exposed to a number of hazards on a daily basis. Laboratory exposures occur via ingestion, inoculation, inhalation, or by contamination of the skin or mucous membranes. The most common routes of exposure to pathogens associated with laboratory work are shown in Table 1 on page 3. Accidental inoculation of infectious material is one of the leading causes of laboratory-associated infections.

According to Sewell (1995), "The most hazardous agent in the laboratory is a microorganism that is frequently associated with laboratory infections, can be transmitted by a variety of routes (especially by aerosols) and

produces a fatal infection with a low infectious dose." The five most frequently reported laboratory-acquired infections in the United States are typhoid fever (*Salmonella typhi*), brucellosis (*Brucella* spp.), Q fever (*Coxiella burnetii*), tuberculosis (*Mycobacterium tuberculosis*) and tularemia (*Francisella tularensis*), respectively. Three of these five organisms are classified as biological terrorism agents because of their highly infectious and potentially lethal characteristics.

Numerous laboratory activities produce aerosols, which lead to a risk of inhalation of infectious material. Examples of aerosol-producing activities include inoculating-loop manipulation such as subculturing and streaking cultures, "cooling" a loop in culture media, and flaming inoculating loops. Pipette activities such as mixing microbial suspensions and dealing with pipette spills on hard surfaces, and needle and syringe manipulation are common methods of generating aerosols. Other means of aerosol generation include centrifugation, using blenders, shakers, sonicators, and mixing instruments pouring or decanting fluids, opening

continued on page 3

Practice Guidelines

The following practice guidelines have been developed by the Clinical Laboratory Advisory Council. They can be accessed at the following website:
www.doh.wa.gov/lqa.htm

Anemia	Lipid Screening
ANA	PAP Smear
Bioterrorism Event Mgmt	Point-of-Care Testing
Bleeding Disorders	PSA
Chlamydia	Rash Illness
Diabetes	Red Cell Transfusion
Group A Strep Pharyngitis	Renal Disease
Group B Streptococcus	STD
Hepatitis	Thyroid
HIV	Tuberculosis
Infectious Diarrhea	Urinalysis
Intestinal Parasites	Wellness

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Regional Meeting Schedule & Agenda

A series of regional meetings to discuss various topics of interest to Washington clinical laboratories will be held from 8:30 a.m. – 12:15 p.m. at the following locations:

May 18: Deaconess Health & Education Center
901 W 5th Ave, Room 267
Spokane, WA 99201

May 19: Moxee Fire Station
2003 Beaudry Road
Yakima, WA 98901

June 1: Public Health Laboratories
1610 NE 150th Street
Shoreline, WA 98155

June 20: SW Washington Medical Center
Education Center, Room 1
400 NE Mother Joseph Place
Vancouver, WA 98668

Agenda (8:30 a.m. – 12:15 p.m.):

Welcome to Participants & Introductions

Romesh Gautom, Director, Washington State Public Health Laboratories (PHL)

UW Clinical Laboratory Initiative

Jon Counts, UW Clinical Assistant Professor

- Assessment/quality improvement in antimicrobial

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Website addresses:

DOH home page: <http://www.doh.wa.gov>

LQA home page: <http://www.doh.wa.gov/lqa.htm>

PHL home page:
<http://www.doh.wa.gov/EHSPHL/PHL/default.htm>

susceptibility testing, including recommendations from clinicians

- Clinician knowledge and utilization of laboratory practice guidelines and electronic medical information systems
- Laboratory/clinician assessment of laboratory delivery system/DOH response to comments
- Technical assistance/training for laboratories in clinical microbiology/CLSI guidelines for diagnostic microbiology for limited resources laboratories, including rapid testing

Laboratory Quality Assurance Update

Susan Walker, Laboratory Quality Assurance MTS Program Manager

- Medical Test Site Licensing Cycle WAC Change
- Serum eGFR (Estimated Glomerular Filtration Rate)

Department of Health Update

Romesh Gautom, Director, Public Health Laboratories

Jinxin Hu, Office of Microbiology Director

Yolanda Houze, BT & Public Health Threats Lab Manager
Preparedness and Response

- **Pandemic Flu**— What are our roles during a flu pandemic? The latest information regarding the influenza surveillance program, testing methods, how to reach us, reporting of results and the Washington State Public Health Laboratories' response plan including lab accessibility will be shared.
- **Bioterrorism/Chemical Terrorism Preparedness**— An update on Laboratory Response Network in our state. Is your lab a Sentinel Lab? The relationship of the clinical laboratory and the Washington State Public Health Laboratories during a response for bioterrorism or chemical terrorism will be reviewed. Suggestions around Bioterrorism training needs will be discussed.
- **New Technologies**—How far have we come since Louis Pasteur? The latest testing technology used at the WAPHL will be reviewed as well as a look at future testing methods. How these new state-of-the-art technologies have dramatically enhanced the services we provide and the turn-around-time on various lab procedures will be discussed.
- **Training Program**—Information/data on various training classes offered in the recent past and the current class offerings will be described. Laboratories will have an opportunity to make suggestions for future classes.

Lab Safety – It's Everyone's Responsibility, cont'd from page 1

culture containers, spilling infectious material, and lyophilization and filtration while under vacuum.

Exposure to blood-borne pathogens is a common hazard that laboratory workers face. The most hazardous laboratory procedure is the use of a syringe and needle. Aerosols can be generated when the user adjusts the volume in a syringe by expelling the contents into the air, when the needle is withdrawn from a rubber stopper, or when the needle separates from the syringe under pressure. Leaking syringes filled with infected blood or other infectious liquid can contaminate both the environment and the operator's fingers. Many of these hazards can be avoided by covering the needle and rubber stopper with a disinfectant-soaked pledget and cleansing the injection site.

Containment of microorganisms is considered to be the best strategy for minimizing the occupational exposure of laboratory workers to the infectious agents they work with. All laboratories should practice the use of primary barriers which provide physical separation of the microorganism from the worker. Workers should consistently use personal protective equipment (PPE) like gloves, masks, face shields, glasses, coats, and gowns. Gloves are considered the most important protective barrier a lab worker can use because contamination of the hands is a frequent exposure route to a variety of pathogens. Lab coats and gowns should be impervious to liquids, cover the area from the hand to the elbow (usually the most contaminated region), and should provide a snug fit around the wrists. Performing aerosol-producing activities within a biological safety cabinet (BSC) will also reduce the risk of aerosol contamination considerably. Strict adherence to microbiological practices and techniques, and proper use of safety equipment like BSCs, safety centrifuge containers and PPE will reduce considerably the risk of exposure to pathogens that laboratorians face in their everyday work.

Table 1. Routes of Exposure Associated with Laboratory Work

Route	Practice
Ingestion	Mouth pipetting Splashes of infectious material into mouth Contaminated articles or fingers placed in mouth Consumption of food in workplace
Inoculation	Needlestick accidents Cuts from sharp objects Animal and insect bites and scratches
Contamination of skin and mucous membranes	Spills or splashes into eyes, mouth, nose Spills or splashes on intact or non-intact skin Contaminated surfaces, equipment, articles
Inhalation	Numerous procedures that produce aerosols

Sewell, D.L. 1995

Reference: Sewell, D.L. 1995. Laboratory-Associated Infections and Biosafety. *Clin Microbiol Rev* 8(3):389-405.

Norovirus: State Public Health Lab Perspective

The probability that acute, brief gastroenteritis is due to norovirus is fairly high since few infectious agents cause an illness of such sudden onset and brief duration. Confirmation of the diagnoses of norovirus illness is done with the use of Real Time Reverse Transcriptase Polymerase Chain Reaction (RT-PCR) to detect viral RNA in specimens of stool or vomitus. For individual cases of acute gastroenteritis, confirming the diagnosis of norovirus infection has no impact on treatment or outcome, and is not generally recommended.

In outbreaks of acute gastroenteritis, confirming suspected norovirus can help guide outbreak control efforts - but even in these situations, confirming the diagnosis by testing specimens from more than three individuals is usually not warranted. Real time RT-PCR for norovirus is available at the Washington State Department of Health Public Health Laboratories **only** for confirming the diagnosis in suspected foodborne outbreaks or in specific situations where an individual is in an occupation where there is a high risk for viral transmission, especially to vulnerable populations. Consultation with local and state health departments is necessary before requests for testing will be approved.

The virus is identified best in stool specimens taken within 48 to 72 hours after symptom onset, although real time RT-PCR may still detect the virus in samples taken as long as five days after onset. Occasionally, the virus can be detected in stool taken as late as two weeks after recovery.

Regional Meetings

A series of four regional meetings to discuss various topics of interest to Washington clinical laboratories will be held from 8:30 a.m. – 12:15 p.m. at various locations around Washington State.

Refer to the article on page 2 of this issue of Elaborations for information about meeting dates, times, locations, and agenda.

Norovirus

See the article on page 3 of this issue of Elaborations for information on Norovirus and the role of the Washington Public Health Laboratory in outbreak control.

Calendar of Events

PHL Training Classes:

(<http://www.doh.wa.gov/ehsphl/phl/training/train.htm>)

Intestinal Parasites

June 14 and 15 Shoreline

Northwest Medical Laboratory Symposium

(<http://www.wsscls.org>)

October 18-21, 2006 Portland

13th Annual Clinical Laboratory Conference

(<http://www.doh.wa.gov/lqa.htm>)

November 13, 2006 Seattle

2007 ASCLS-Washington Spring Meeting

(<http://www.wsscls.org>)

April 2007 Tri-Cities

Contact information for the events listed above can be found on page 2. The Calendar of Events is a list of upcoming conferences, deadlines, and other dates of interest to the clinical laboratory community. If you have events that you would like to have included, please mail them to ELABORATIONS at the address on page 2. Information must be received at least one month before the scheduled event. The editor reserves the right to make final decisions on inclusion.